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TO: Chief District Engineers
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Branch Manager for Project Delivery and Preservation

FROM: Nancy Albright, P.E.
Director
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Director
Division of Traffic Operations

DATE: January 2, 2013

SUBJECT: Traffic Signal Loops in Proposal Projects

The purpose of this memorandum is to provide updated guidance on the replacement of traffic signal loops that are impacted by proposal projects (such as resurfacing, rehabilitation, HSIP projects, etc.). This document addresses the role of various Branches in estimating the bid items and quantities for this work and what type of information should be included in the project documents. In addition, this document clarifies when to use traditional traffic signal loops and when to use preformed loops. Hopefully, this guidance will help ensure that traffic loops are replaced in an efficient manner.

If a proposal project impacts traffic signal loops, bid items and quantities for loop replacement should be included in the project. If loops are included in the project, it is recommended that the project documents include intersection layouts and/or a chart with the number and types of all loops required. An example of such documentation is attached for your consideration. Determination of whether to include loop work in projects and determination of bid items and associated quantities should be a collaborative effort between the Project Manager and the District Traffic Engineer.

For projects involving asphalt pavement, damaged loops should be replaced with traditional loop wire detection. On asphalt pavement projects, the following bid items should be used to address traffic signal loops that are impacted:



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| Code | Pay Item | Pay Unit |
|-------|--------------------------------|-------------|
| 4792* | Conduit 1" | Linear Foot |
| 4793 | Conduit 1 1/4" | Linear Foot |
| 4795 | Conduit 2" | Linear Foot |
| 4811 | Electrical Junction Box Type B | Each |
| 4820* | Trenching and Backfilling | Linear Foot |
| 4830* | Loop Wire | Linear Foot |
| 4850* | Cable-No. 14/1 Pair | Linear Foot |
| 4895* | Loop Saw Slot and Fill | Linear Foot |

** Note: Always used when installing loops with asphalt resurfacing.*

The items in the above list should be the only bid items necessary to install loops. Descriptions of each bid item, including guidance on calculation of quantities, are as follows:

- Conduit – 1" conduit is used to house the loop wire (maximum of six wires) from the saw slot to the junction box or pole where it is then spliced to the lead-in cable (bid item 4850). 1 1/4" conduit is typically used to house lead-in cable (maximum of three cables) from the junction box to the pole or cabinet. 2" conduit is used to house lead-in cable (maximum of eight cables) from the junction box to the pole or cabinet and for all roadway crossings.
- Electrical Junction Box Type B – is installed near the shoulder to house the transition from loop wire to lead-in cable. These will only be required if the existing box needs to be replaced or if the original installation did not include one.
- Trenching and Backfilling – is used for installing conduit and should equal the combined quantity of all conduit quantities. If several conduits are placed within the same trench, the quantity should be equal to one times the distance between the junction box, pole, or cabinet.
- Loop Wire – is installed in the saw slot and inside conduit. 6' x 30' quadrapole loops are typically located at the stop bar, and 6' x 6' loops are typically set back from the stop bar. Each 6' x 30' quadrapole loop will have a total quantity of 264', and each 6' x 6' loop will have a total quantity of 72'. Quantities also need to be included to account for the distance from the loop through the transition from the saw slot to the junction box, pole, or cabinet. This wire is typically referred to as the homerun. For each homerun, the distance from the loop to the junction box, pole, or cabinet will need to be multiplied by two in order to calculate the quantity of wire correctly. No splicing shall be permitted in a run of loop wire. Loop wire shall only be spliced to lead-in cable. Splicing of loop wire to lead-in cable shall only be permitted in a junction box or signal pole. All splicing materials are incidental to the bid item for loop wire.
- Cable-No. 14/1 Pair (Lead-In) – is installed from the controller to the junction box/pole where the loop wire ends. No splicing shall be permitted in a run of lead-in cable. Lead-in

cable shall only be spliced to loop wire. Splicing of loop wire to lead-in cable shall only be permitted in a junction box or signal pole. All splicing materials are incidental to the bid item for cable.

- Loop Saw Slot and Fill – is installed in the surface of the existing road prior to resurfacing or after the milling but before the overlay. One 6' x 30' loop will have a total quantity of 102' of loop saw slot and fill, and one 6' x 6' loop will have a total quantity of 24' of loop saw slot and fill. The distance from the loop to a point nine to twelve inches from the curb or shoulder will need to be included in your quantity for this bid item. One saw slot can house three individual loop homeruns (two wires per homerun).

For projects involving concrete pavement, damaged loops should be replaced with preformed loops. Preformed loops should be installed prior to installation of the final surface. Preformed loops shall not be installed more than twelve inches below the elevation of the final pavement surface. Concrete joints and steel reinforcement shall be located to avoid the preformed loop installations. On concrete pavement projects, the following bid items should be used to address traffic signal loops that are impacted:

| Code | Pay Item | Pay Unit |
|-------------|--------------------------------|-------------|
| 4792* | Conduit 1" | Linear Foot |
| 4793 | Conduit 1 1/4" | Linear Foot |
| 4795 | Conduit 2" | Linear Foot |
| 4811 | Electrical Junction Box Type B | Each |
| 4820* | Trenching and Backfilling | Linear Foot |
| 4850* | Cable-No. 14/1 Pair | Linear Foot |
| 4894* | Preformed Loop/Lead-In | Linear Foot |
| 20452ES835* | Preformed Loops (6X6) | Linear Foot |
| 20453ES835* | Preformed Quadrapole Loops | Linear Foot |

**Note: Always used when installing loops with concrete resurfacing.*

The items in the above list should be the only bid items necessary to install preformed loops and to install the homerun lead-in (bid item 4894) from the loops to the junction box/pole/cabinet. Descriptions of each bid item, including guidance on calculation of quantities, are as follows:

- Conduit – 1" conduit is used to house the homerun lead-in (bid item 4894, maximum of one preformed tube) from the saw slot to the junction box/pole where it is spliced to the lead-in cable (bid item 4850). 1 1/4" conduit is used to house lead-in cable (bid item 4850, maximum of 3 cables) from the junction box to the pole or cabinet. 2" is used to house lead-in cable (bid item 4850, max. 8 cables) from the junction box to the pole or cabinet and for all roadway crossings.

- Electrical Junction Box Type B – is installed near the shoulder to house the transition from loop wire to lead-in cable. These will only be required if the existing box needs to be replaced or if the original installation did not include one.
- Trenching and Backfilling – is used for installing conduit and should equal the quantity of all conduit quantities combined. If several conduits are placed within the same trench, the quantity should be equal to one times the distance between the junction box, pole, or cabinet.
- Preformed Loop/Lead-In – is installed from the nearest corner of the preformed loop (bid items 20452ES835 or 20453ES835) through the transition from the saw slot to the junction box/pole/cabinet. The nearest corner is defined as the corner of the loop that is closest to the location where the lead-in cable (bid item 4850) is to be spliced with the preformed loop/lead-in. The quantity of Preformed Loop/Lead In shall be equal to one times the distance between the nearest corner of the loop to the location where it is spliced to the lead-in cable (bid item 4850).
- Preformed Loops – are typically 6' x 6' loops that are installed set back from the stop bar. One 6' x 6' loop will have a quantity of 24'.
- Preformed Quadrapole Loop – are typically 6' x 30' loops that are placed at the stop bar. One 6' x 30' loop will have a quantity of 102'.
- Cable-No. 14/1 Pair (Lead-In) – is cable installed from the controller to the junction box/pole where the Preformed Loop/Lead-In ends. No splicing shall be permitted in a run of Lead-In cable. Lead-In cable shall only be spliced to Preformed Loop/Lead-In. Splicing of Lead-In cable to Preformed Loop/Lead-In shall only be permitted in a junction box or signal pole. All splicing materials are incidental to the bid item for cable.

If you have any questions regarding the contents of this memorandum, please contact Ted Swansegar in the Division of Traffic Operations at 502-564-3020.

RJW:TAS:alw
Attachment

cc: Ted Swansegar
Lynn Witmer
Diana Radcliffe
Steve Criswell

TRAFFIC LOOP SUMMARY

| INTERSECTION | DIRECTION | NUMBER OF QUADRAPOLE 6x30 LOOPS | | NUMBER OF 6x6 LOOPS | | CONDUIT 1" BACKFILLING | | TRENCHING AND LOOP WIRE | | CABLE * 14/1PAIR | | LOOP SAW SLOT AND FILL | | JB TYPE B CONDUIT 1 1/4" CONDUIT 2" | |
|---------------------|------------|---------------------------------|---|---------------------|---|------------------------|----|-------------------------|-----|------------------|---|------------------------|---|-------------------------------------|---|
| | | 2 | 0 | 0 | 0 | 3 | 3 | 648 | 260 | 264 | 1 | 0 | 0 | 0 | 0 |
| MAIN ST. & SIDE ST. | NORTHBOUND | 2 | 0 | 0 | 0 | 3 | 3 | 648 | 260 | 264 | 1 | 0 | 0 | 0 | 0 |
| | EASTBOUND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SOUTHBOUND | 2 | 0 | 0 | 0 | 10 | 10 | 588 | 40 | 234 | 1 | 0 | 0 | 0 | 0 |
| | WESTBOUND | 1 | 0 | 0 | 0 | 20 | 20 | 324 | 175 | 132 | 1 | 0 | 0 | 0 | 0 |
| | TOTAL | 5 | 0 | 0 | 0 | 33 | 33 | 1560 | 475 | 630 | 3 | 0 | 0 | 0 | 0 |



